Directorate of
Intelligence

Confidential

25X1

Predicting Debt Rescheduling: A Quantitative Approach

25X1

A Technical Intelligence Report

Confidential

GI 85-10114
DI 85-10020
April 1985

Copy 447

Sanitized Copy Approved for Release 2009/11/13 : CIA-RDP86T00586R000300310007-7

Page Denied

Sanitized Copy Approved for Release 2009/11/13 : CIA-RDP86T00586R000300310007-7

Directorate of Intelligence

Confidential
[redacted] 25X1

Predicting Debt Rescheduling: A Quantitative Approach [redacted] 25X1

A Technical Intelligence Report

This paper was prepared by [redacted] Office of 25X1
Global Issues, [redacted] Analytical Support 25X1
Group. Comments and queries are welcome and may be directed to the Chief, Economics Division, OGI, [redacted] 25X1

Confidential

GI 85-10114
DI 85-10020
April 1985

[redacted] 25X1

Predicting Debt Rescheduling: A Quantitative Approach [redacted]

25X1

Summary

Information available as of 17 April 1985 was used in this report.

In the last four years, about 40 countries have rescheduled their official or private debts. Almost all the reschedulings occurred during economic or political crises. In many instances, moreover, warnings preceded the actual reschedulings. Although not supplanting well-reasoned, sound analysis of debt situations, sophisticated quantitative examinations of linkages between economic conditions and debt reschedulings can be useful. In particular, the multicountry nature of this approach allows a comprehensive survey of a large number of countries and selection of those indicated as potential trouble spots; those can then be followed up with more intensive analysis of their specific situations. [redacted] 25X1

We have systematically explored the links between international and domestic economic conditions and rescheduling for some 75 less developed countries (LDCs), using logistic regression. This technique statistically estimates the probability of a discrete event given trends in underlying quantitative variables. In addition to its use in rescheduling analysis, it has potential for predicting political events, such as coups or elections, using appropriate preindicators. This technique is limited by the availability of sufficient data on suspected preindicators. [redacted] 25X1

Our analysis indicates this technique does well in forecasting reschedulings. In the 1977-83 period, for example, we found that applying logistic regression to economic indicators, such as consumer price inflation, debt and debt service, exports, imports, and reserves, correctly predicted in more than three-fourths of the cases whether or not a country would reschedule within a three-year period. [redacted] 25X1

Our analysis of 1983 economic trend data indicated that 50 countries would reschedule in 1983, 1984, or 1985. Twenty-eight of these countries have already rescheduled in 1983 or 1984. The remainder—Bangladesh, Bolivia, Burma, Cameroon, Congo, Colombia, Egypt, Gabon, The Gambia, Guyana, Ghana, India, Israel, Jordan, Kenya, Mauritania, Panama, South Korea, Syria, Tanzania, Thailand, and Zimbabwe—were predicted to reschedule by the technique in 1983-85 but have not done so as of yet. This result could be due to an incorrect conclusion of the model or to the fact they may reschedule later in 1985. [redacted] 25X1

GI 85-10114
DI 85-10020
April 1985

25X1

To attempt to delineate which of the two reasons seems more likely, we obtained 1984 economic trend data for nine of the countries and applied the technique again. As a result, we were able to refine somewhat the rescheduling expectations for 1985 for these countries. We found that the likelihood of rescheduling has gone up for Burma, and down for India, Kenya, and Egypt. There was no real change for South Korea, Thailand, Jordan, Israel, and Bolivia.

25X1

25X1

Contents

25X1

Predicting Debt Rescheduling: A Quantitative Approach

25X1

Introduction

Economic and financial theory suggest that a number of preindicators exist for a country having to reschedule its debt. For example, low international reserves relative to imports might indicate a need for rescheduling. Similarly, rampant inflation often leads to deteriorations in the domestic economy and in international payments balances requiring debt restructuring

25X1

This study quantifies these relationships. Specifically, we have tested three alternative statistical procedures against a number of potential determinants. In two of these—logistic regression and discriminant analysis—we examined the linkage between economic indicator trends in one year and whether the country rescheduled in that or the succeeding two years. Thus, for example, economic trends in 1982 were examined for their linkages with rescheduling in 1982, 1983, or 1984.

25X1

A three-year period was chosen largely for practical reasons. The lags in availability of international economic indicator data prevent predicting for the next year. Therefore, a three-year period is necessary to have information soon enough to predict rescheduling. For the third method—catastrophe theory—data requirements prevented the use of the three-year period. Hence, the results of this method are more interesting than practical.

25X1

Choosing a Methodology

We developed our quantitative methodology for predicting rescheduling by examining three trial methodologies: logistic regression; linear discriminant analysis; and a method based on mathematical catastrophe theory (see appendix A):

- *Logistic regression* uses statistics to estimate the probability of an event, such as a rescheduling, based on one or more predictor variables, such as the consumer price index. The technique fits an equation to the observed cumulative probability of the event. The fitted curve can then be used to estimate probabilities.

- *Discriminant analysis* seeks to draw a divider between events. If the consumer price index were the only predictor variable, discriminant analysis would identify a value for the index. Countries with a price index higher than this value would be predicted to reschedule; countries with a lower index would not. When more than one predictor variable is used, discriminant analysis generates a dividing line, plane, or higher dimensional linear shape. The dividing shape is called the discriminant.

- *Catastrophe theory* is based on the notion of a graphical relationship between one variable and several other variables—in this case, a graph of reschedulings versus the predictor variables. Because a country either reschedules or does not, the graph will have a break between the two events.

25X1

Data

To determine the best methodology for predicting reschedulings, we examined each model against a set of indicator and rescheduling data for some 75 LDCs for 1977 through 1983. For the indicator data, we used economic trends commonly thought to influence reschedulings: consumer price inflation, ratio of exports to imports, ratio of total international reserves to imports, ratio of debt service to exports, ratio of interest payments to exports, share of official debt in total debt and debt service, and ratio of debt to exports. The indicator data were obtained from IMF publications and a CIA data base on debt and debt service. Information on whether or not a country had

25X1

25X1

rescheduled was obtained from CIA files [redacted]

For testing the three models, the data were arranged as follows:

- The information on rescheduling was transformed into a binary variable equal to 0 if a country did not reschedule in a given year or the two succeeding years, and equal to 1 if it did.
- The economic indicator data were transformed into ratios and percent changes as appropriate.
- All data on individual countries were pooled into a single series for each variable.

As a result, the actual estimation procedures took place against a series of 525 observations of pooled data for 75 countries over seven years. [redacted]

25X1

Evaluating the Models

Each model was applied to the data and the percentage of successful classifications tallied. The results were evaluated on two criteria:

- The percentage of correct classifications.
- The degree to which incorrect classifications were evenly distributed between rescheduling and nonrescheduling countries. [redacted]

In evaluating the models it is necessary to establish a trade-off between the two criteria. The problem can be understood by a simple example. In the aggregate, countries used roughly one-quarter of their opportunities to reschedule. Thus, a prediction that countries never reschedule would be right nearly 75 percent of the time. But none of the reschedulings would be successfully predicted. This defeats the purpose of the model. [redacted]

25X1

Ideally, the model should predict rescheduling and nonrescheduling with equal accuracy. But achieving a balance may reduce the model's overall performance. Two of the methods—discriminant analysis and catastrophe theory—automatically set the trade-off between overall correctness and balance. Logistic regression analysis requires the analyst to determine the trade-off. Since the purpose is to discriminate between countries that will reschedule and those that will not, an excess of errors in either direction is undesirable. Therefore, a close balance was sought even though the total number of correct classifications fell, typically by about 2 percentage points. [redacted]

25X1

The differences in percentage of total correct classifications among the models are not large (table 1). In all of the models not based on logistic regression, nonreschedulings are classified more accurately than reschedulings. This arises from the near certainty that a country with favorable economic conditions will not reschedule. [redacted]

25X1

The discriminant analysis approach proved the most successful in terms of overall correctness—but the balance was quite poor. The catastrophe theory results also show an imbalance. [redacted]

25X1

Logistic regression provided an acceptable level of overall correctness (76.3 percent) and a good balance (76.7 percent correct for reschedulings, 76.1 percent for nonreschedulings). Consequently, we concluded that the logistic regression model offered the best approach for forecasting rescheduling. [redacted]

25X1

Using the Model

25X1

In the logistic regression model chosen, the variables included as predictors of rescheduling were: consumer price inflation, the ratio of export earnings to imports, the ratio of total reserves to imports, and the change in the ratio of debt service to exports. This model was used to calculate the probability of rescheduling for the 75 countries examined in the study for 1977-85, using economic indicator data for 1977-83. [redacted]

25X1

To turn the probabilities of rescheduling into a prediction as to whether or not a country will reschedule within some period, a threshold probability had to be established. Initially, one might guess that the cutpoint should be 50 percent; that is, if a country has a

Table 1
Comparison of Estimation Methods

Method Indicators	Percent of Correct Classification		
	Rescheduling	Nonrescheduling	Total
Logistic regression			
Basic	71.5	75.5	74.5
Basic with percent annual changes	75.9	74.5	75.0
Basic with annual changes	76.7	76.1	76.3
Discriminant analysis			
Basic	72.2	77.7	75.7
Basic with percent annual changes	75.0	78.8	77.4
Basic with annual changes	74.1	79.1	77.7
Catastrophe theory			
Basic	68.6	72.5	71.2
Basic with percent annual changes	76.0	75.1	76.7
Basic with annual changes	76.0	73.5	74.4

25X1

greater chance of rescheduling than not, a rescheduling should be predicted. However, a graph of the percentage of correct classifications shows that the optimal cutpoint is lower than one-half (figure 1 on page 6). Ideally, the cutoff point should maximize the percentage of correctly classified events, and make equal the percentage of correctly classified reschedulings and nonreschedulings. Figure 1 shows that the cutoff point maximizing overall correct classifications lies a little to the right of the point where the "rescheduling" and "nonrescheduling" lines intersect.

25X1

Since the goal of the model is to predict whether countries reschedule or not, a balance of correct classifications between the two categories is important. Assuming a country not to reschedule, for example, would provide an accuracy of 76 percent, but would not predict any reschedulings. As figure 1 demonstrates, a balance of correct classifications can be obtained without a drastic decrease in the overall percentage of correct classifications by setting the cutoff point at 0.342. This choice sets the percentage of correctly classified reschedulings to 76.7 percent; nonreschedulings to 76.1 percent; and overall classifications to 76.3 percent.

Applying the Model

Although historical data must be used to estimate the model, we used the model for predictions by:

1. Applying the 1983 values of the economic indicator data for the four chosen variables to the model's coefficient structure.

2. Choosing those countries predicted to reschedule in 1983-85 on the basis of that economic indicator data.

3. Comparing those predictions with those of the countries that actually rescheduled in 1983-84.

4. Taking a closer look at some of the countries that had not rescheduled, using estimates of 1984 data.

25X1

Using this procedure, the model predicted that 50 of the 75 countries would reschedule in 1983-85, given their 1983 economic indicators (table 2). Press and government reports showed that only 28 of these 50

25X1

Table 2
Rescheduling Predictions for 1983, 1984, and 1985

	Probability	Predicted to Reschedule? [a]	Has Rescheduled? [b]
Trinidad and Tobago	0.05	No	No
Central African Republic	0.06	No	Yes
Singapore	0.09	No	No
Hong Kong	0.10	No	No
Botswana	0.11	No	No
Rwanda	0.12	No	No
Nepal	0.14	No	No
Suriname	0.15	No	No
Burundi	0.17	No	No
Haiti	0.22	No	No
Malaysia	0.22	No	No
Papua New Guinea	0.22	No	No
Swaziland	0.23	No	No
Ethiopia	0.24	No	No
El Salvador	0.24	No	No
Guatemala	0.25	No	No
The Bahamas	0.28	No	No
Mali	0.28	No	No
Fiji	0.28	No	No
Indonesia	0.29	No	No
Barbados	0.29	No	No
Somalia	0.30	No	No
Paraguay	0.30	No	No
Mauritius	0.32	No	No
Pakistan	0.34	No	No
Togo	0.34	Yes	Yes
Syria	0.35	Yes	No
Venezuela	0.36	Yes	Yes
Bangladesh	0.38	Yes	No
India	0.39	Yes	No
Sri Lanka	0.40	Yes	Yes
South Korea	0.42	Yes	No
Liberia	0.42	Yes	Yes
Mauritania	0.44	Yes	No
Guyana	0.46	Yes	No
Thailand	0.47	Yes	No
Gabon	0.48	Yes	No
Nigeria	0.51	Yes	Yes
Zimbabwe	0.52	Yes	No
Ghana	0.58	Yes	No
Zambia	0.61	Yes	Yes
Senegal	0.65	Yes	Yes

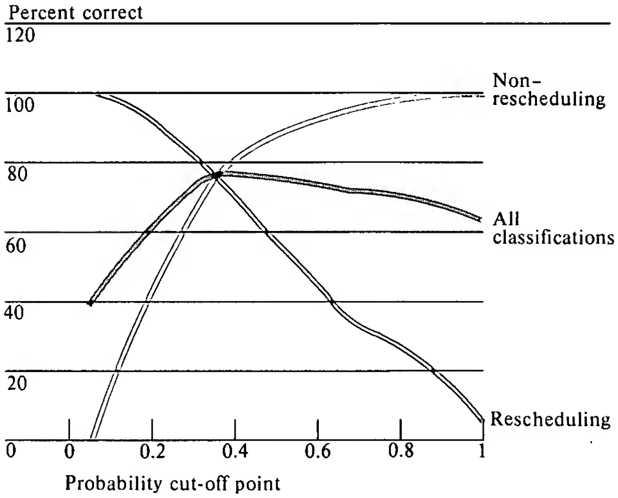
Table 2 (continued)

	Probability	Predicted to Reschedule? [a]	Has Rescheduled? [b]
The Gambia	0.66	Yes	No
Congo	0.66	Yes	No
Dominican Republic	0.69	Yes	Yes
Costa Rica	0.71	Yes	Yes
Madagascar	0.71	Yes	Yes
Cameroon	0.74	Yes	No
Uruguay	0.75	Yes	Yes
Kenya	0.76	Yes	No
Honduras	0.79	Yes	Yes
Sierra Leone	0.80	Yes	Yes
Burma	0.80	Yes	No
Jamaica	0.80	Yes	Yes
Colombia	0.81	Yes	No
Jordan	0.85	Yes	No
Malawi	0.87	Yes	Yes
Tanzania	0.88	Yes	No
Philippines	0.91	Yes	Yes
Peru	0.94	Yes	Yes
Niger	0.95	Yes	Yes
Israel	0.95	Yes	No
Sudan	0.96	Yes	Yes
Ecuador	0.96	Yes	Yes
Egypt	0.96	Yes	No
Ivory Coast	0.97	Yes	Yes
Nicaragua	0.97	Yes	Yes
Zaire	0.98	Yes	Yes
Chile	0.98	Yes	Yes
Mexico	0.98	Yes	Yes
Bolivia	0.99	Yes	No
Morocco	0.99	Yes	Yes
Brazil	0.99	Yes	Yes
Argentina	0.99	Yes	Yes
Panama	1.00	Yes	No

[a] In 1983, 1984, or 1985 from 1983 indicator data.
[b] In 1983 or 1984.

25X1

Figure 1
Effect of Cut-Off Point on Classifications



25X1

305315 4-85

countries had rescheduled by the end of 1984; the remaining 22—Bangladesh, Bolivia, Burma, Cameroon, Congo, Colombia, Egypt, Gabon, The Gambia, Guyana, Ghana, India, Israel, Jordan, Kenya, Mauritania, Panama, South Korea, Syria, Tanzania, Thailand, and Zimbabwe—had not.

25X1

The missed prediction for these countries could be just that: a missed prediction. On the other hand, because the model is looking only at the current year and two years ahead, the prediction may be simply unconfirmed. In this case, the usefulness of the model is to indicate which countries to watch in the last year of the prediction period. We attempted to take a closer look at nine of these countries using 1984 data and found that the probability of rescheduling:

- Fell for India, Kenya, and Egypt.
- Remained about the same for South Korea, Thailand, Jordan, Israel, and Bolivia.
- Rose for Burma (table 3).

Table 3
Rescheduling Predictions for 1984, 1985, and 1986 Using 1984 Indicator Data

	Probability	Reschedule?
Bolivia	0.99	Yes
Burma	0.95	Yes
Egypt	0.85	Yes
India	0.16	No
Israel	0.99	Yes
Jordan	0.82	Yes
Kenya	0.60	Yes
South Korea	0.42	Yes
Thailand	0.49	Yes

This table is Confidential.

A Final Note

Logistic regression, or any statistical tool, cannot supplant well-reasoned, sound analysis of the potential occurrence of an event. In some instances it even may provide potentially misleading results. In the case of South Korea, for example, it predicts, albeit barely, a 1983-85 rescheduling, but most other evidence and sources indicate such an outcome is unlikely. Indeed, we believe South Korea is in a strong international financial position. These tools can, nevertheless, provide useful complementary support. This model carries out such a modest function, providing a way to use leading economic indicators to predict changes in the odds for or against a country formally asking its creditors for a rescheduling of its debt.

25X1

25X1

Appendix A

Methods of Estimation

Models of rescheduling were developed using three methodologies—logistic regression, linear discriminant analysis, and a method based on mathematical catastrophe theory. Logistic regression provided the model that performed best according to the evaluation criteria. That model was used to develop the probabilities and predictions in this report.

Logistic Regression

Logistic regression is a standard statistical technique for estimating probabilities based on a set of continuous predictor variables.[1] The model used to derive the results on the debt rescheduling problem was obtained from a stepwise logistic regression. This procedure identifies the independent variable with the greatest classificatory power and creates an initial model from that variable. Then, the variable that can make the greatest marginal contribution to the model is incorporated. The process repeats until none of the unincorporated variables can make a significant contribution.

Independent variables that are highly correlated may be removed from the model. The correlated variables are not only predictors of the dependent variable—they are also predictors of each other. Thus, when a correlated variable enters the model, the marginal contribution of other correlated variables will drop sharply. If their contribution to the model's performance becomes sufficiently small, they will be removed.[2]

Since the model must predict rescheduling on the basis of current conditions, rescheduling was lagged two years and "current" was assumed to be 1983. The model was estimated for pre-1983 data. The predicted rescheduling probabilities were calculated for 1983-85.[3]

Logistic regressions were performed on three sets of independent variables:[4]

- The basic set.
- The basic set with the gross annual change [5] in each variable.
- The basic set with the percentage annual change in each variable.

[1] Logistic regression is a variation on linear regression, the most commonly used regression technique. In a linear model, the dependent variable can be made arbitrarily large or small by selecting appropriate values for the independent variables. But, if the variable of interest is a probability (as in logistic regression), it must never exceed unity or be less than zero. Logistic regression meets this restriction by taking a linear combination of the independent variables, then subjecting it to a transformation called the logistic transform, or logit. In geometric terms, the logit bends the line into an S-shaped curve that ranges from zero to one.

[2] Correlations among the independent variables in a regression, if severe, may warrant the construction of an artificial set of variables with the correlations removed (as in factor analysis). Because the independent variables are ratios, many of which have the same numerator or denominator, there are correlations. The effects of these on the regression were explored in some detail. Construction of an artificial set of independent variables was not warranted.

[3] There are two undesirable aspects associated with this procedure. First, the model must predict this year's decision based on previous years' conditions, whereas the decisionmaker may use current information, if available. This objection, of course, can never entirely be overcome when predicting events. Second, the lag reduces the amount of data available to the estimation procedure. When generating the model, economic conditions in 1981 were paired with rescheduling in 1981, 1982, or 1983. Data later than 1981 could not be used, because rescheduling information was not available past 1983.

[4] When deciding whether or not to reschedule, decisionmakers may consider not only current economic conditions, but also where the economy is headed. Poor but rapidly improving economies may yield a repayment. Good but rapidly deteriorating conditions could trigger a rescheduling. Assessing the direction of an economy is complex. For the present study, simple methods were used to incorporate such information. The annual percentage change in each variable was used as an indicator of economic direction. The magnitude of the annual change was used as an alternative.

[5] The changes were calculated using the previous year as a base. For example, the change in the consumer price index in 1978 was obtained by subtracting the index in 1977 from the index in 1978. Regressions using gross or percentage changes were not able to use 1977 data because no earlier data were available.

For the basic indicators with their gross annual changes (the best performing set of independent variables), the variables with nonzero coefficients were:

- Consumer price index (CPID).
- Ratio of exports earnings to imports (EXPIMP).
- Ratio of total reserves to imports (RSIMP).
- Ratio of debt interest to export earnings (INTEXP).
- Change in the ratio of debt service to exports (DDSEXP).

For readability, the linear part of the model and its logistic transform can be written separately. Letting BETA represent the linear part of the model,[6]

BETA = 2.2324 − 0.00138*CPID − 0.6983*EXPIMP − 17.053*INTEXP + 2.387*RSIMP + 4.823*CDSEXP

The probability of not rescheduling in a given three years is estimated by the logit transformation of BETA:[7]

P = EXP(BETA) / [1 + EXP(BETA)].

The probability of rescheduling is estimated by:

PROB = 1 − P

[6] When interpreting the model, little significance should be attached to the list of variables that were included. Because correlations are present among the independent variables, the exclusion of a particular variable may not mean that it lacked predictive power, but rather that some other variable presented the same information in a marginally better form. Also, little significance should be attached to the signs of the coefficients in the model equation. When correlations are present, the signs require very careful interpretation. Without such interpretation, some of the signs may seem paradoxical. In the present model, for example, a high ratio of export earnings to imports would seem to promote rescheduling. This, of course, is not a real effect, but an artifact of correlations among the variables. The presence of paradoxical signs does not invalidate the model's overall performance. Rather, it means that the component parts of the model (that is, terms in the regression equation) cannot stand on their own as models of the effects of individual variables.

[7] The S-shaped curve produced by the logit transformation is a generic form used to estimate probability functions. It is the standard form for preparing such estimates when the exact nature of the probability form is not know. C. C. Brown's chi-square test was used to assess any lack of fit between the shape of the logistic curve and the shape of the data. The test gives the probability that the differences between the ideal curve and the data are due to sampling error, assuming that the errors are normally distributed. For the model used to derive the key findings, the probability is 25.2 percent.

A debt rescheduling is predicted if the probability of rescheduling is sufficiently large—for this problem, the cutoff point was chosen to be 0.342. Accordingly, 76.7 percent of the reschedulings were correctly classifed; 76.1 percent of the nonreschedulings were correctly classified; and 76.3 percent of the overall classifications were correct.[8]

The optimal cutoff point is less than one-half (figure 1). Ideally, the cutoff point should maximize the percentage of correctly classified events, and make equal the percentage of correctly classified reschedulings and nonreschedulings. The cutoff point maximizing overall correct classifications lies a little to the right of the point where the "rescheduling" and "nonrescheduling" lines intersect (figure 1).

Since the goal of the model is to discriminate reschedulings from nonreschedulings, a balance of correct classifications between the two categories is importan.[9] As the figure demonstrates, this can be obtained without a drastic decrease in the overall percentage of correct classifications.

The foregoing analysis shows that the logistic curve does not closely model the form of the econometric data. Still, the overall performance of the regression model is acceptable—and better than the performance of two competing methodologies.

Logistic regression gives two kinds of results—a probability of rescheduling, and a prediction of whether or not rescheduling will occur. The predictions are much simpler to interpret than the probabilities. Although the probability figures are useful in identifying close calls, and in assessing the degree to which a country's economic status has changed, interpreting the probabilities involves subtleties and cannot be done intuitively.

[8] The maximum percentage of total correct classifications is 77.0, corresponding to a cutoff point of 0.358. The percentage of correctly classified nonreschedulings is then 78.8, with 74.1 of the reschedulings correctly classified. The cost of improving the balance between the categories is a decline of 0.7 in the percentage of total correct classifications. This corresponds to an expected loss of less than one correct prediction among the 75 countries.

[9] Some policymakers may prefer to err on the side of caution—that is, to increase the percentage of correctly predicted reschedulings at the cost of predicting fewer nonreschedulings correctly. Since that is a judgmental matter, this study aims for equal predictive power in both categories.

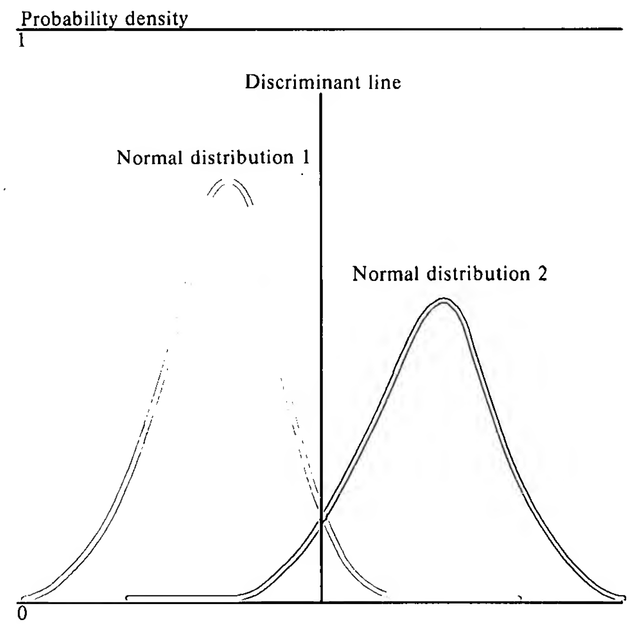
Alternative Methods

Two methods of estimation were used as alternatives to logistic regression—linear discriminant analysis, and a method based on mathematical catastrophe theory. Neither of the alternatives performed as well as logistic regression. Discriminant analysis yielded a higher percentage of correct classifications (77.7 percent versus 76.3 percent for logistic regression), but the classifications were unbalanced (74.1 percent for reschedulings, 79.1 percent for nonreschedulings). Catastrophe theory scored 76.7 percent correct predictions (76.0 percent for rescheduling, 75.1 percent for nonrescheduling).

Linear Discriminant Analysis

Discriminant analysis is an outgrowth of the theory of Gaussian distributions and assumes that the data are samples drawn from two or more Gaussian distributions with the same variances, but different means [10] (figure 2). The distributions overlap. The goal of discriminant analysis is to draw lines separating the distributions. The lines serve a similar function to cutoff point in logistic regression.

Figure 2
Example of a Linear Discriminant



25X1

305316 4-85

For predicting reschedulings, the data are not single values as illustrated in figure 2, but are vectors of values comprising the independent variables. The corresponding discriminant is not a line, but a higher dimensional analogue of a line. To view the distributions and the discriminant, it is possible to reduce a multidimensional set of independent variables to a single artificial variable, called the canonical variable. The distributions of reschedulings and nonreschedulings across values of the canonical variable illustrate the fundamental source of difficulty in discriminating reschedulings—the economic indicators characterize countries that do not reschedule far better than countries that do (figure 3). Nonreschedulings are grouped at the higher values of the canonical variable. Reschedulings occur at all but the highest values. The ideal histograms shown in figure 2 can, in large part, be separated by a discriminant line. The actual distributions in figure 3 substantially overlap. A clean separation cannot be effected.

[10] If the within-group variances in the raw data are not equal, the data can be transformed to better meet the assumptions underlying the method. The variances of the independent variables differ markedly between rescheduling and nonrescheduling. These differences were reduced by the use of the cube root transform.

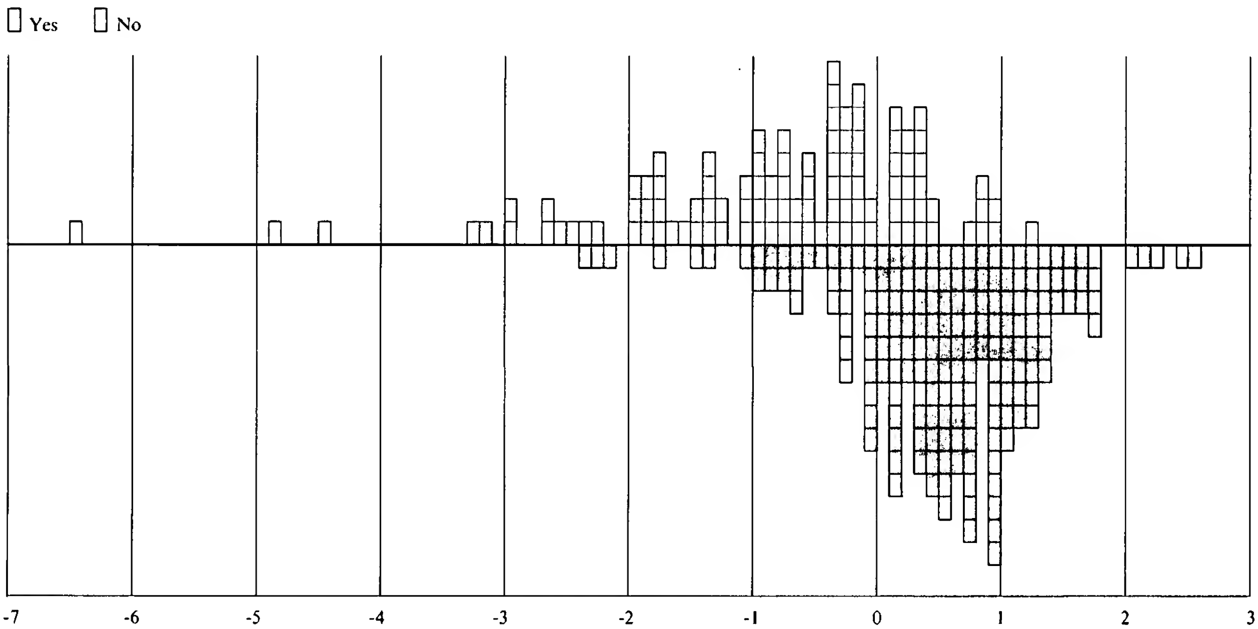
Mathematical Catastrophe Theory

Catastrophe theory is a branch of topology concerned with surfaces having a fold, cusp, or other discontinuity. Its application to mathematical modeling lies in the use of such surfaces as modeled response surfaces.

The kinds of regression discussed in the previous section permit only one dependent variable. Other methods of estimation allow multiple dependent variables. In that case, the dependent variables describe a

Figure 3
Histogram of Canonical Variable

Canonical variable



Note: Each box represents a case (a country in a given three-year period).

25X1

305317 4-85

multidimensional surface. The points along the surface predict how the dependent variables will respond to sets of values of the independent variables; hence, they are called response surfaces.

Most shapes used as models for response surfaces are continuous—without breaks, folds, and so forth. These will produce models in which the dependent variable changes smoothly over time, provided that the independent variables do likewise. This kind of surface can only approximately model behaviors like rescheduling, where economic conditions may change smoothly, yet the response shifts from nonrescheduling to rescheduling without any intermediaries.

Castastrophe theory offers a variety of surfaces having "catastrophes" as candidate response surface models. Some kinds of catastrophes involve discontinuities. When the dependent variable moves across a discontinuity, an instantaneous change of value will occur.

Catastrophe theoretic models also permit the response surface to have a property called hysteresis. *Hysteresis* means that the value of the dependent variables may depend not only on the independent variables' current values, but also on their history.

Rescheduling behavior may exhibit hysteresis. Consider a country with a problem economy. The country reschedules. The decisionmakers may wish to avoid a second rescheduling, for a variety of reasons—such as avoiding further damage to the country's perceived creditworthiness. If so, the country's rescheduling history should be included as an independent variable.

Another possible source of hysteresis involves the decisionmaker's expectations. Consider two countries with similar problem economies. One's economy is improving; the other's is deteriorating. Perhaps the decisionmaker with the improving economy would opt to delay rescheduling, while the other decisionmaker might reschedule in the hope of ameliorating the problem. In this case, the dependent variable, rescheduling, would depend in part on the independent variables' history.

Since most applications of catastrophe theory are qualitative, this study used a hybrid catastrophe theory/discriminant analysis approach. An attempt was made to use some of the insights provided by catastrophe theory, by incorporating possible hysteresis effects into the model—that is, perhaps countries that reschedule should be considered separately from countries that did not reschedule. Accordingly, the countries were divided into three groups—prerescheduling (including those that did not reschedule at all), rescheduling, and postrescheduling. When a discriminant analysis was run against the basic independent variables with their annual percentage changes, this method produced the highest overall percentage of correct classifications (81.7 percent). However, only 76.0 percent of reschedulings were correctly classified—as opposed to 76.7 percent for logistic regression. The prerescheduling and postrescheduling countries were classified correctly 78.3 percent and 46.2 percent of the time, respectively.[11] The three-year lag that was applied to the independent variable in the other two models was not applicable here because of data constraints. Consequently, because this model predicted rescheduling only for the same year as the indicator data, the percentage accuracy is not directly comparable to the other models.

[11] These figures were combined via a weighted average to find the percentage of correctly classified nonreschedulings (75.1 percent) given in table 1.

Comparison of Estimative Methods

For each method of estimation, three models were generated. These modeled the actual rescheduling behavior of the 75 countries based on one of the following sets of indicators:
- The basic indicators.
- The basic indicators and their annual percentage changes.
- The basic indicators and their gross annual changes.

The basic indicators together with their gross annual changes produced the most successful models. The models were applied to each country separately and the percentage of successful classifications recorded; these results were presented in table 1. The results were evaluated according to two criteria:
- The percentage of classifications that were correct.
- The degree to which incorrect classifications were evenly distributed between rescheduling and nonrescheduling countries.

In evaluating the models, it is necessary to establish a trade-off between the two criteria. The problem can be understood by way of a simple example. In the aggregate, countries used roughly one-quarter of their opportunities to reschedule. Thus, a prediction that countries never reschedule would be right nearly 75 percent of the time. But none of the reschedulings would be successfully predicted. This defeats the purpose of the model.

Ideally, the model should predict rescheduling and nonrescheduling with equal accuracy. But achieving a balance may reduce the model's overall performance. Two of the methods—discriminant analysis and catastrophe theory—automatically set the trade-off between overall correctness and balance. Logistic regression analysis requires the analyst to determine the trade-off. Since the purpose is to identify countries that will reschedule from those that will not, an excess of errors in either direction is undesirable. Therefore, a close balance was sought even though the total number of correct classifications declined slightly.[12]

[12] For the most successful regression model, the decline was from 77.0 percent to 76.3 percent correct classifications.

As was shown in table 1, the differences in percentage of total correct classifications among the models is not large. However, the degree to which reschedulings are accurately classified varies considerably. In all of the models not based on logistic regression, nonreschedulings generally are classified more accurately than reschedulings. It is much more certain that a country with a favorable economy will not reschedule, than that a country with an unfavorable economy will.

The catastrophe theory proved the most successful in terms of overall correctness. Although catastrophe theory classified 76.7 percent of the total cases correctly, only 76 percent of the reschedulings were correctly classified. In other words, the model is highly successful at telling when a country will not reschedule, but does worse than logistic regression in classifying reschedulings. The discriminant analysis results show a similar imbalance.

In summary, logistic regression provided an acceptable level of overall correctness (76.3 percent) and a good balance (76.7 percent correct for reschedulings, 76.1 percent for nonreschedulings). Catastrophe theory and discriminant analysis had marginally higher levels of overall correctness, but for discriminant analysis this fact was outweighed by the greater imbalance between the percentage of correct prediction to reschedulings and nonreschedulings. For catastrophe theory, the absence of the three-year lag applied to the other methods limits the usefulness of the results or forecasts. This method is of mainly technical interest. Consequently, the estimates given in this paper derive from logistic regression on the basic variables and their annual changes.

Appendix B

Data on Economic Indicators for Selected Foreign Countries, 1977-84

Key to Economic Indicator Abbreviations

Abbreviation	Economic Indicator
CPID	Rate of inflation based on consumer price index
DBEXP	Ratio of debt burden to export earnings
DSEXP	Ratio of debt service to export earning
EXPIMP	Ratio of export earnings to imports
IMFIMP	Ratio of International Monetary Fund reserves to imports
INTDS	Ratio of debt interest to debt service
INTEXP	Ratio of debt interest to export earnings
OFTLDB	Ratio of official to total debt burden
OFTLDS	Ratio of official to total debt service
RSIMP	Ratio of total reserves to imports
RSCL	Country rescheduled debt = 1 Country did not reschedule debt = 0

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
ARGENTINA	77	176.587	1.335	0.266	1.358	0.000	0.312	0.083	0.168	0.163	0.000	0.659
	78	175.323	1.538	0.418	1.669	0.034	0.292	0.122	0.168	0.083	0.000	1.033
	79	159.562	1.797	0.325	1.166	0.023	0.480	0.156	0.133	0.100	0.000	1.087
	80	100.763	2.103	0.421	0.761	0.025	0.526	0.222	0.113	0.108	0.000	0.514
	81	104.500	2.857	0.614	0.970	0.025	0.660	0.405	0.073	0.059	1.000	0.314
	82	164.743	3.773	0.723	1.429	0.017	0.674	0.487	0.069	0.065	1.000	0.454
	83	343.812	3.672	0.677	1.744	0.000	0.605	0.409	0.071	0.077	1.000	0.276
BAHAMAS	77	3.213	0.045	0.016	0.839	0.002	0.157	0.003	0.124	0.632	0.000	0.019
	78	6.096	0.045	0.009	0.853	0.002	0.322	0.003	0.116	0.164	0.000	0.018
	79	9.046	0.026	0.008	0.949	0.001	0.323	0.003	0.086	0.135	0.000	0.015
	80	12.108	0.021	0.006	0.891	0.002	0.406	0.002	0.116	0.128	0.000	0.013
	81	11.100	0.046	0.011	0.996	0.002	0.557	0.006	0.104	0.095	0.000	0.024
	82	6.031	0.080	0.020	0.890	0.002	0.629	0.012	0.082	0.039	0.000	0.032
	83	4.075	0.064	0.013	1.685	0.005	0.717	0.010	0.083	0.067	0.000	0.052
BANGLADESH	77	10.300	4.850	0.147	0.409	0.000	0.373	0.055	0.943	0.716	0.000	0.166
	78	13.200	5.091	0.180	0.363	0.000	0.441	0.080	0.939	0.728	0.000	0.161
	79	8.200	5.084	0.279	0.345	0.000	0.245	0.068	0.804	0.346	0.000	0.155
	80	18.500	4.765	0.125	0.292	0.000	0.385	0.048	0.933	0.540	0.000	0.091
	81	13.200	4.982	0.148	0.293	0.000	0.422	0.062	0.941	0.606	0.000	0.045
	82	9.276	5.820	0.184	0.334	0.003	0.733	0.135	0.940	0.631	0.000	0.073
	83	8.084	5.606	0.220	0.445	0.011	0.570	0.125	0.944	0.709	0.000	0.255
BARBADOS	77	8.254	0.659	0.114	0.354	0.012	0.227	0.026	0.566	0.136	0.000	0.112
	78	9.531	0.604	0.082	0.415	0.010	0.430	0.035	0.559	0.318	0.000	0.147
	79	16.867	0.598	0.110	0.357	0.007	0.452	0.050	0.589	0.349	0.000	0.119
	80	14.547	0.513	0.085	0.434	0.010	0.474	0.040	0.620	0.224	0.000	0.119
	81	14.600	1.051	0.153	0.340	0.009	0.648	0.099	0.476	0.275	0.000	0.150
	82	10.297	0.949	0.150	0.478	0.000	0.628	0.094	0.469	0.422	0.000	0.200
	83	5.221	0.904	0.139	0.589	0.003	0.548	0.076	0.409	0.300	0.000	0.190
BOLIVIA	77	7.983	2.339	0.272	1.073	0.012	0.360	0.098	0.483	0.276	0.000	0.329
	78	10.311	2.876	0.600	0.816	0.012	0.249	0.149	0.486	0.153	0.000	0.199
	79	19.753	2.616	0.383	0.852	0.000	0.445	0.170	0.495	0.263	1.000	0.178
	80	47.275	2.433	0.327	1.416	0.000	0.554	0.181	0.509	0.284	1.000	0.165
	81	32.100	2.904	0.329	0.991	0.000	0.671	0.221	0.497	0.310	1.000	0.125
	82	123.618	3.276	0.362	1.677	0.000	0.845	0.306	0.509	0.328	1.000	0.347
	83	275.558	2.944	0.681	2.723	0.000	0.340	0.231	0.491	0.251	1.000	0.424
	84	600.000	5.076	1.676	0.913	0.000	0.217	0.363	0.491	0.251	1.000	0.342
BOTSWANA	77	13.166	1.688	0.158	0.654	0.005	0.358	0.057	0.588	0.196	0.000	0.299
	78	9.003	1.289	0.172	0.627	0.003	0.476	0.082	0.412	0.211	0.000	0.327
	79	11.563	0.677	0.094	0.838	0.004	0.563	0.053	0.439	0.211	0.000	0.390
	80	13.895	0.562	0.079	0.728	0.007	0.589	0.047	0.519	0.293	0.000	0.390
	81	16.200	0.715	0.089	0.500	0.011	0.761	0.068	0.560	0.228	0.000	0.274
	82	11.532	0.857	0.126	0.664	0.013	0.480	0.061	0.451	0.193	0.000	0.390
	83	10.262	0.713	0.129	0.860	0.015	0.328	0.042	0.548	0.319	0.000	0.514
BRAZIL	77	43.330	2.885	0.434	0.914	0.012	0.386	0.168	0.152	0.122	0.000	0.451
	78	38.750	3.649	0.585	0.841	0.009	0.423	0.247	0.132	0.094	0.000	0.607
	79	52.790	3.370	0.634	0.770	0.009	0.492	0.312	0.125	0.084	0.000	0.347
	80	82.810	2.788	0.571	0.807	0.011	0.551	0.314	0.125	0.082	0.000	0.184
	81	105.600	2.761	0.576	0.967	0.009	0.580	0.334	0.117	0.078	1.000	0.239

Confidential

Sanitized Copy Approved for Release 2009/11/13 : CIA-RDP86T00586R000300310007-7

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
BRAZIL	82	97.957	3.505	0.771	0.958	0.012	0.646	0.498	0.113	0.099	1.000	0.169
	83	141.990	0.357	0.730	1.303	0.000	0.563	0.411	1.140	0.123	1.000	0.249
BURMA	77	-1.185	3.163	0.295	0.756	0.000	0.210	0.062	0.633	0.203	0.000	0.339
	78	-5.994	4.546	0.356	0.716	0.000	0.247	0.088	0.643	0.225	0.000	0.252
	79	5.632	3.720	0.376	1.203	0.000	0.256	0.096	0.640	0.233	0.000	0.512
	80	0.604	3.827	0.392	1.336	0.000	0.298	0.117	0.647	0.216	0.000	0.604
	81	0.300	4.417	0.502	1.279	0.024	0.263	0.132	0.617	0.174	0.000	0.555
	82	4.985	6.292	0.591	0.930	0.032	0.381	0.225	0.662	0.201	0.000	0.253
	83	8.428	6.206	0.722	1.062	0.020	0.330	0.238	0.642	0.269	0.000	0.266
	84	5.999	5.259	0.612	2.088	0.020	0.421	0.257	0.642	0.269	0.000	0.449
BURUNDI	77	6.863	0.457	0.034	1.200	0.000	0.200	0.007	0.838	0.333	0.000	1.052
	78	23.857	1.003	0.042	0.706	0.048	0.345	0.014	0.848	0.345	0.000	0.638
	79	36.566	1.061	0.040	0.682	0.029	0.310	0.012	0.889	0.452	0.000	0.451
	80	9.421	2.190	0.101	0.390	0.044	0.424	0.043	0.928	0.333	0.000	0.445
	81	7.800	2.496	0.132	0.442	0.046	0.351	0.046	0.873	0.266	0.000	0.329
	82	9.926	2.545	0.120	0.409	0.034	0.448	0.054	0.881	0.286	0.000	0.126
	83	8.861	2.548	0.197	0.515	0.049	0.264	0.052	0.882	0.518	0.000	0.134
CAMEROON	77	14.737	1.198	0.086	0.899	0.000	0.466	0.040	0.603	0.444	0.000	0.045
	78	12.451	1.555	0.154	0.760	0.003	0.423	0.065	0.581	0.364	0.000	0.039
	79	6.643	1.652	0.157	0.880	0.005	0.491	0.077	0.549	0.270	0.000	0.076
	80	9.290	1.609	0.166	0.864	0.008	0.587	0.098	0.534	0.299	0.000	0.093
	81	10.600	2.068	0.234	0.774	0.008	0.620	0.145	0.566	0.304	0.000	0.052
	82	12.297	2.077	0.317	0.880	0.012	0.559	0.177	0.592	0.285	0.000	0.051
	83	15.157	1.895	0.302	1.096	0.006	0.477	0.144	0.609	0.322	0.000	0.092
CENT. AFR. REPUB.	77	11.053	1.325	0.051	1.272	0.000	0.341	0.017	0.462	0.707	0.000	0.333
	78	11.483	1.765	0.064	1.308	0.030	0.348	0.022	0.448	0.261	0.000	0.343
	79	9.300	1.763	0.008	1.143	0.027	2.167	0.016	0.496	0.500	1.000	0.486
	80	17.357	1.825	0.024	1.426	0.000	0.143	0.003	0.624	0.679	1.000	0.536
	81	12.000	2.779	0.086	0.830	0.000	0.676	0.058	0.695	0.706	1.000	0.633
	82	12.000	2.960	0.060	0.789	0.011	0.689	0.041	0.723	0.800	1.000	0.442
	83	12.000	3.267	0.285	0.789	0.021	0.201	0.057	0.755	0.762	1.000	0.426
CHILE	77	92.233	2.120	0.487	0.970	0.000	0.244	0.119	0.442	0.331	0.000	0.177
	78	40.151	2.391	0.605	0.825	0.013	0.287	0.174	0.322	0.293	0.000	0.295
	79	33.333	1.938	0.462	0.923	0.009	0.380	0.176	0.221	0.266	0.000	0.362
	80	35.135	2.065	0.514	0.912	0.013	0.489	0.251	0.159	0.134	0.000	0.490
	81	19.700	3.234	0.889	0.614	0.010	0.539	0.479	0.112	0.072	1.000	0.443
	82	9.941	3.764	0.853	1.052	0.020	0.545	0.465	0.093	0.073	1.000	0.483
	83	27.204	3.884	0.795	1.393	0.000	0.488	0.388	0.097	0.077	1.000	0.726
COLOMBIA	77	33.036	1.264	0.159	1.205	0.038	0.415	0.066	0.605	0.466	0.000	0.739
	78	17.788	1.097	0.158	1.059	0.025	0.446	0.071	0.606	0.420	0.000	0.665
	79	24.712	1.216	0.231	1.021	0.023	0.399	0.092	0.527	0.299	0.000	0.928
	80	26.534	1.297	0.189	0.846	0.025	0.575	0.108	0.461	0.334	0.000	0.833
	81	27.500	2.086	0.304	0.569	0.029	0.663	0.202	0.421	0.304	0.000	0.816
	82	24.549	2.400	0.390	0.565	0.032	0.620	0.242	0.403	0.281	1.000	0.663
	83	19.773	2.832	0.449	0.605	0.053	0.556	0.250	0.388	0.341	1.000	0.395
CONGO	77	14.474	2.896	0.233	0.900	0.000	0.344	0.080	0.662	0.353	0.000	0.055
	78	10.089	5.418	0.254	0.581	0.000	0.426	0.108	0.618	0.418	0.000	0.029

Confidential

Sanitized Copy Approved for Release 2009/11/13 : CIA-RDP86T00586R000300310007-7

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
CONGO	79	8.121	1.812	0.242	1.751	0.000	0.354	0.086	0.621	0.276	0.000	0.111
	80	7.296	1.054	0.113	2.222	0.000	0.402	0.045	0.581	0.362	0.000	0.157
	81	17.100	1.126	0.119	1.079	0.002	0.356	0.042	0.480	0.387	0.000	0.107
	82	12.724	1.426	0.285	1.210	0.004	0.504	0.144	0.444	0.258	0.000	0.042
	83	7.803	1.748	0.453	1.580	0.005	0.331	0.150	0.438	0.251	0.000	0.014
COSTA RICA	77	4.131	0.940	0.114	0.811	0.000	0.405	0.046	0.502	0.303	0.000	0.156
	78	6.019	1.178	0.292	0.712	0.007	0.278	0.081	0.519	0.182	0.000	0.128
	79	9.290	1.490	0.293	0.669	0.005	0.338	0.099	0.442	0.216	0.000	0.067
	80	18.064	1.658	0.201	0.675	0.000	0.626	0.126	0.464	0.314	0.000	0.078
	81	37.100	2.337	0.202	0.796	0.000	0.545	0.110	0.418	0.354	1.000	0.094
	82	90.080	2.872	0.158	0.994	0.000	1.097	0.174	0.445	0.637	1.000	0.239
	83	32.617	3.473	0.548	1.298	0.000	0.520	0.285	0.463	0.380	1.000	0.501
DOMINICAN REPUBLIC	77	12.966	1.169	0.160	0.800	0.000	0.326	0.052	0.430	0.329	0.000	0.156
	78	3.562	1.526	0.209	0.684	0.000	0.460	0.096	0.426	0.283	0.000	0.124
	79	9.172	1.331	0.351	0.716	0.000	0.284	0.100	0.429	0.150	0.000	0.153
	80	16.686	1.496	0.215	0.587	0.000	0.634	0.136	0.538	0.269	0.000	0.099
	81	7.500	1.383	0.245	0.712	0.000	0.560	0.137	0.600	0.428	1.000	0.119
	82	7.721	2.605	0.447	0.532	0.000	0.498	0.222	0.647	0.371	1.000	0.083
	83	4.374	2.896	0.516	0.534	0.005	0.368	0.190	0.706	0.542	1.000	0.113
ECUADOR	77	13.136	1.109	0.128	0.806	0.000	0.369	0.047	0.295	0.232	0.000	0.349
	78	15.530	1.842	0.201	0.921	0.005	0.478	0.096	0.416	0.141	0.000	0.308
	79	10.302	1.582	0.521	1.041	0.005	0.218	0.113	0.341	0.257	0.000	0.283
	80	13.895	1.581	0.275	1.114	0.010	0.464	0.127	0.338	0.306	0.000	0.360
	81	13.000	1.947	0.427	1.132	0.011	0.433	0.185	0.348	0.439	1.000	0.248
	82	16.106	2.343	0.640	1.075	0.000	0.450	0.288	0.311	0.348	1.000	0.146
	83	45.122	2.497	0.518	1.504	0.008	0.493	0.255	0.291	0.231	1.000	0.430
EGYPT	77	12.791	4.836	0.667	0.355	0.000	0.308	0.206	0.822	0.434	0.000	0.091
	78	11.046	6.012	0.751	0.258	0.000	0.330	0.248	0.815	0.382	0.000	0.069
	79	9.947	6.651	0.659	0.479	0.000	0.275	0.181	0.781	0.281	0.000	0.127
	80	20.627	4.542	0.539	0.627	0.000	0.252	0.136	0.773	0.263	0.000	0.186
	81	10.400	4.713	0.657	0.368	0.003	0.308	0.202	0.752	0.348	0.000	0.080
	82	14.855	5.329	0.842	0.344	0.000	0.407	0.342	0.722	0.383	1.000	0.079
	83	16.088	5.059	0.708	0.356	0.003	0.390	0.276	0.753	0.459	1.000	0.083
	84	18.000	4.956	0.709	0.367	0.003	0.302	0.214	0.753	0.459	1.000	0.077
EL SALVADOR	77	11.897	0.312	0.078	1.047	0.005	0.256	0.020	0.792	0.221	0.000	0.206
	78	13.251	0.553	0.062	0.780	0.009	0.591	0.037	0.706	0.450	0.000	0.217
	79	15.918	0.467	0.051	1.089	0.008	0.602	0.031	0.734	0.443	0.000	0.121
	80	17.371	0.570	0.058	1.116	0.000	0.651	0.038	0.813	0.472	0.000	0.082
	81	14.800	1.005	0.095	0.809	0.000	0.609	0.058	0.814	0.546	0.000	0.081
	82	11.760	1.294	0.111	0.797	0.000	0.579	0.064	0.820	0.613	0.000	0.131
	83	13.094	1.412	0.155	0.789	0.000	0.393	0.061	0.833	0.721	0.000	0.186
ETHIOPIA	77	16.478	1.424	0.090	0.848	0.019	0.378	0.034	0.921	0.709	0.000	0.474
	78	14.424	1.825	0.110	0.575	0.000	0.378	0.042	0.910	0.643	0.000	0.246
	79	16.000	1.475	0.068	0.736	0.000	0.461	0.031	0.963	0.789	0.000	0.249
	80	4.493	1.655	0.082	0.589	0.006	0.490	0.040	0.943	0.726	0.000	0.102
	81	6.100	2.129	0.125	0.526	0.000	0.428	0.054	0.875	0.582	0.000	0.322
	82	5.938	2.244	0.155	0.514	0.000	0.530	0.082	0.874	0.552	0.000	0.219
	83	-0.712	2.469	0.216	0.466	0.005	0.383	0.083	0.886	0.620	0.000	0.147

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
FIJI	77	7.563	0.492	0.049	0.588	0.011	0.477	0.023	0.680	0.511	0.000	0.396
	78	5.990	0.490	0.098	0.559	0.009	0.359	0.035	0.672	0.446	0.000	0.292
	79	7.248	0.465	0.059	0.547	0.007	0.480	0.028	0.690	0.539	0.000	0.221
	80	14.547	0.537	0.066	0.670	0.009	0.364	0.024	0.617	0.413	0.000	0.234
	81	11.200	0.758	0.099	0.493	0.008	0.577	0.057	0.648	0.479	0.000	0.184
	82	7.014	0.859	0.094	0.559	0.010	0.840	0.079	0.778	0.701	0.000	0.226
	83	6.723	1.278	0.169	0.587	0.020	0.638	0.108	0.760	0.676	0.000	0.274
GABON	77	13.840	1.162	0.133	1.874	0.004	0.269	0.036	0.166	0.111	1.000	0.012
	78	10.774	1.453	0.290	1.795	0.000	0.387	0.112	0.205	0.105	1.000	0.029
	79	7.955	0.847	0.182	3.476	0.000	0.383	0.070	0.259	0.137	0.000	0.030
	80	12.334	0.646	0.193	3.226	0.000	0.294	0.057	0.281	0.118	0.000	0.126
	81	8.700	0.510	0.152	2.611	0.000	0.346	0.053	0.315	0.137	0.000	0.203
	82	16.651	0.500	0.157	2.985	0.000	0.337	0.053	0.298	0.120	0.000	0.391
	83	11.719	0.417	0.148	2.880	0.009	0.305	0.045	0.332	0.235	0.000	0.339
GAMBIA	77	12.465	0.615	0.027	0.612	0.000	0.231	0.006	0.829	0.308	0.000	0.259
	78	8.744	1.186	0.105	0.390	0.000	0.122	0.013	0.570	0.122	0.000	0.199
	79	6.115	1.339	0.100	0.413	0.000	0.259	0.026	0.641	0.052	0.000	0.010
	80	6.724	3.577	0.143	0.192	0.000	0.178	0.025	0.691	0.089	0.000	0.027
	81	6.100	4.890	0.316	0.219	0.000	0.407	0.128	0.720	0.151	0.000	0.024
	82	10.839	3.428	0.254	0.456	0.000	0.625	0.159	0.781	0.295	0.000	0.083
	83	10.629	3.153	0.232	0.426	0.000	0.614	0.142	0.871	0.596	0.000	0.026
GHANA	77	116.406	0.803	0.041	0.887	0.000	0.396	0.016	0.681	0.697	0.000	0.118
	78	73.085	0.845	0.071	1.106	0.000	0.356	0.025	0.631	0.598	0.000	0.225
	79	54.415	1.021	0.083	1.165	0.000	0.359	0.030	0.660	0.667	0.000	0.256
	80	50.083	0.979	0.095	1.190	0.000	0.243	0.023	0.717	0.350	0.000	0.154
	81	116.490	1.186	0.084	0.961	0.007	0.382	0.032	0.730	0.525	0.000	0.125
	82	22.297	1.413	0.108	1.238	0.000	0.450	0.048	0.770	0.634	1.000	0.203
	83	122.537	2.640	0.229	0.634	0.011	0.386	0.088	0.782	0.633	1.000	0.205
GUATEMALA	77	12.444	0.334	0.032	1.164	0.012	0.563	0.018	0.682	0.346	0.000	0.540
	78	8.000	0.555	0.059	0.866	0.010	0.593	0.035	0.633	0.352	0.000	0.457
	79	11.482	0.609	0.066	0.845	0.009	0.709	0.047	0.693	0.393	0.000	0.364
	80	10.742	0.586	0.060	0.974	0.014	0.729	0.044	0.728	0.448	0.000	0.230
	81	11.400	0.970	0.088	0.746	0.005	0.644	0.057	0.761	0.472	0.000	0.088
	82	0.449	1.303	0.116	0.842	0.000	0.572	0.067	0.798	0.569	0.000	0.086
	83	1.950	1.407	0.159	1.100	0.007	0.376	0.060	0.764	0.584	0.000	0.193
GUYANA	77	8.247	1.559	0.123	0.822	0.000	0.476	0.059	0.514	0.295	0.000	0.060
	78	15.252	1.484	0.168	1.060	0.000	0.343	0.058	0.565	0.286	0.000	0.160
	79	17.762	1.696	0.312	0.921	0.000	0.271	0.084	0.585	0.254	0.000	0.042
	80	14.090	1.425	0.179	0.982	0.000	0.365	0.065	0.612	0.420	0.000	0.025
	81	24.700	1.838	0.228	0.805	0.000	0.448	0.102	0.711	0.340	0.000	0.014
	82	18.524	2.739	0.203	0.861	0.000	0.832	0.169	0.731	0.321	1.000	0.036
	83	13.498	3.972	0.692	0.671	0.000	0.327	0.226	0.746	0.416	1.000	0.024
HAITI	77	6.492	0.968	0.133	0.702	0.000	0.156	0.021	0.856	0.553	0.000	0.132
	78	-2.594	1.229	0.127	0.666	0.010	0.198	0.025	0.901	0.497	0.000	0.129
	79	13.049	1.234	0.067	0.681	0.016	0.240	0.016	0.917	0.512	0.000	0.156
	80	17.786	1.437	0.122	0.518	0.000	0.227	0.028	0.867	0.458	0.000	0.035
	81	5.700	2.411	0.176	0.335	0.000	0.290	0.051	0.735	0.474	0.000	0.046
	82	9.177	2.545	0.128	0.308	0.000	0.444	0.057	0.775	0.338	0.000	0.008

Confidential

Sanitized Copy Approved for Release 2009/11/13 : CIA-RDP86T00586R000300310007-7

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
HAITI	83	7.972	2.538	0.183	0.288	0.000	0.312	0.057	0.836	0.293	0.000	0.015
HONDURAS	77	8.383	1.154	0.130	0.895	0.000	0.450	0.059	0.621	0.456	0.000	0.256
	78	6.215	1.282	0.153	0.876	0.009	0.494	0.076	0.613	0.430	0.000	0.203
	79	12.484	1.288	0.197	0.888	0.007	0.449	0.088	0.614	0.335	0.000	0.193
	80	15.607	1.425	0.166	0.822	0.000	0.622	0.103	0.603	0.391	0.000	0.117
	81	10.200	1.850	0.202	0.801	0.000	0.694	0.140	0.614	0.402	0.000	0.092
	82	9.982	2.362	0.285	0.918	0.000	0.582	0.166	0.650	0.412	1.000	0.143
	83	9.488	2.778	0.370	0.759	0.005	0.582	0.216	0.688	0.442	1.000	0.132
HONG KONG	77	4.000	0.081	0.013	0.920	0.000	0.049	0.001	0.022	0.035	0.000	0.303
	78	5.400	0.109	0.025	0.855	0.000	0.051	0.001	0.014	0.016	0.000	0.312
	79	14.000	0.124	0.022	0.884	0.000	0.031	0.001	0.015	0.012	0.000	0.250
	80	13.500	0.127	0.025	0.881	0.000	0.090	0.002	0.017	0.013	0.000	0.215
	81	9.700	0.136	0.036	0.881	0.000	0.047	0.002	0.016	0.020	0.000	0.235
	82	11.900	0.182	0.044	0.891	0.000	0.024	0.001	0.014	0.007	0.000	0.273
	83	9.800	0.194	0.043	0.914	0.000	0.027	0.001	0.013	0.012	0.000	0.314
INDIA	77	8.400	2.347	0.161	0.960	0.000	0.299	0.048	1.009	0.835	1.000	0.642
	78	2.500	2.376	0.177	0.848	0.009	0.321	0.057	0.976	0.796	0.000	0.664
	79	6.400	2.120	0.151	0.794	0.016	0.378	0.057	1.030	0.816	0.000	0.605
	80	11.400	2.118	0.142	0.578	0.022	0.335	0.048	0.948	0.770	0.000	0.386
	81	13.000	2.275	0.171	0.538	0.021	0.297	0.051	0.973	0.685	0.000	0.281
	82	7.876	2.211	0.174	0.633	0.025	0.439	0.077	0.001	0.668	0.000	0.285
	83	11.813	1.254	0.070	0.590	0.036	1.347	0.094	0.056	0.590	0.000	0.366
	84	9.999	2.371	0.208	0.627	0.036	0.473	0.098	0.923	0.195	0.000	0.396
INDONESIA	77	11.107	1.137	0.128	1.742	0.011	0.318	0.041	0.573	0.199	0.000	0.332
	78	8.107	1.247	0.199	1.740	0.010	0.222	0.044	0.578	0.185	0.000	0.303
	79	21.904	0.968	0.158	2.165	0.010	0.312	0.049	0.559	0.221	0.000	0.429
	80	18.525	0.759	0.098	2.022	0.015	0.383	0.037	0.565	0.287	0.000	0.398
	81	12.200	0.787	0.107	1.677	0.015	0.411	0.044	0.568	0.289	0.000	0.333
	82	9.500	0.905	0.123	1.322	0.013	0.424	0.052	0.545	0.311	0.000	0.176
	83	11.300	1.168	0.171	1.288	0.004	0.359	0.061	0.506	0.330	0.000	0.223
	84	10.999	1.166	0.188	1.668	0.004	0.478	0.090	0.506	0.330	0.000	0.338
ISRAEL	77	34.557	2.622	0.205	0.534	0.000	0.456	0.093	0.587	0.413	0.000	0.224
	78	50.620	2.352	0.137	0.522	0.000	0.599	0.082	0.619	0.506	0.000	0.274
	79	78.295	2.274	0.303	0.524	0.004	0.277	0.084	0.693	0.318	0.000	0.273
	80	131.000	2.281	0.212	0.570	0.003	0.582	0.123	0.697	0.591	0.000	0.275
	81	116.800	2.515	0.364	0.555	0.000	0.392	0.143	0.683	0.395	0.000	0.298
	82	120.387	2.836	0.403	0.544	0.000	0.641	0.258	0.693	0.497	0.000	0.365
	83	145.605	3.160	0.592	0.537	0.004	0.467	0.276	0.688	0.367	0.000	0.373
	84	340.000	3.094	0.549	0.608	0.004	0.435	0.239	0.688	0.367	0.000	0.281
IVORY COAST	77	27.553	0.920	0.136	1.228	0.000	0.379	0.051	0.299	0.170	0.000	0.087
	78	12.991	1.335	0.190	0.998	0.004	0.451	0.086	0.258	0.157	0.000	0.148
	79	16.577	1.524	0.251	1.009	0.005	0.397	0.100	0.275	0.154	0.000	0.045
	80	14.679	1.470	0.280	1.048	0.003	0.375	0.105	0.257	0.139	0.000	0.006
	81	8.800	1.879	0.330	1.063	0.000	0.516	0.170	0.238	0.165	0.000	0.007
	82	7.353	2.267	0.505	1.055	0.000	0.530	0.268	0.258	0.131	1.000	0.002
	83	5.907	2.943	0.644	0.969	0.000	0.522	0.336	0.271	0.180	1.000	0.011
JAMAICA	77	11.191	1.227	0.201	0.878	0.000	0.405	0.081	0.395	0.224	1.000	0.046

Confidential

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
JAMAICA	78	34.893	1.263	0.237	0.920	0.000	0.365	0.086	0.460	0.239	1.000	0.051
	79	29.088	1.482	0.268	0.824	0.000	0.435	0.117	0.495	0.307	1.000	0.049
	80	27.307	1.572	0.253	0.822	0.000	0.455	0.115	0.527	0.308	0.000	0.070
	81	12.740	1.739	0.421	0.661	0.001	0.317	0.133	0.551	0.205	0.000	0.050
	82	6.546	2.481	0.432	0.529	0.003	0.647	0.280	0.585	0.370	1.000	0.072
	83	11.588	2.763	0.664	0.482	0.000	0.388	0.258	0.604	0.346	1.000	0.041
JORDAN	77	14.441	2.997	0.245	0.180	0.004	0.362	0.089	0.628	0.300	0.000	0.404
	78	6.920	3.737	0.358	0.198	0.004	0.456	0.163	0.549	0.234	0.000	0.473
	79	14.340	3.194	0.355	0.205	0.005	0.475	0.169	0.595	0.256	0.000	0.466
	80	10.988	3.042	0.407	0.239	0.007	0.539	0.219	0.570	0.205	0.000	0.389
	81	7.700	2.738	0.431	0.232	0.005	0.524	0.226	0.611	0.214	0.000	0.307
	82	7.428	2.933	0.425	0.237	0.005	0.593	0.252	0.664	0.285	0.000	0.264
	83	5.013	4.086	0.580	0.191	0.002	0.527	0.306	0.684	0.489	0.000	0.272
	84	3.000	3.192	0.453	0.318	0.002	0.453	0.205	0.684	0.489	0.000	0.258
KENYA	77	14.852	0.988	0.074	0.930	0.000	0.490	0.036	0.617	0.475	0.000	0.335
	78	16.954	1.348	0.139	0.598	0.000	0.425	0.059	0.612	0.372	0.000	0.160
	79	7.985	1.654	0.164	0.667	0.000	0.508	0.083	0.562	0.382	0.000	0.289
	80	13.766	1.573	0.167	0.595	0.000	0.505	0.084	0.563	0.355	0.000	0.166
	81	11.800	1.989	0.244	0.554	0.000	0.448	0.109	0.573	0.293	0.000	0.094
	82	20.483	2.449	0.397	0.600	0.001	0.498	0.198	0.613	0.230	0.000	0.112
	83	11.507	2.603	0.372	0.752	0.007	0.505	0.188	0.645	0.358	0.000	0.258
	84	9.999	2.187	0.312	0.699	0.007	0.429	0.134	0.646	0.358	0.000	0.219
LIBERIA	77	6.223	0.592	0.059	0.965	0.000	0.279	0.017	0.773	0.649	0.000	0.049
	78	7.357	0.688	0.052	1.048	0.000	0.500	0.026	0.703	0.621	1.000	0.029
	79	11.548	0.872	0.139	1.059	0.000	0.298	0.042	0.669	0.217	1.000	0.082
	80	13.766	0.953	0.066	1.103	0.000	0.578	0.038	0.712	0.293	1.000	0.008
	81	7.600	1.196	0.051	1.188	0.000	0.868	0.045	0.758	0.407	1.000	0.016
	82	5.948	0.956	0.049	1.422	0.000	1.346	0.067	0.777	0.654	1.000	0.013
	83	2.763	1.197	0.116	1.454	0.000	0.675	0.078	0.785	0.651	1.000	0.051
MADAGASCAR	77	3.111	0.722	0.042	0.975	0.000	0.385	0.016	0.888	0.888	0.000	0.163
	78	6.609	0.902	0.069	0.875	0.000	0.270	0.019	0.744	0.588	0.000	0.103
	79	14.016	1.813	0.132	0.616	0.000	0.312	0.041	0.584	0.362	1.000	0.006
	80	18.203	2.619	0.146	0.670	0.000	0.438	0.064	0.611	0.359	1.000	0.012
	81	30.500	6.533	0.284	0.493	0.001	0.854	0.243	0.626	0.335	1.000	0.054
	82	31.418	7.487	0.537	0.469	0.002	0.740	0.397	0.641	0.232	1.000	0.040
	83	19.288	6.987	1.295	0.519	0.000	0.287	0.372	0.657	0.385	1.000	0.061
MALAWI	77	4.167	2.036	0.142	0.859	0.000	0.332	0.047	0.684	0.276	0.000	0.311
	78	8.428	2.721	0.191	0.548	0.000	0.470	0.090	0.690	0.331	0.000	0.171
	79	11.331	2.541	0.245	0.560	0.000	0.570	0.140	0.554	0.211	0.000	0.134
	80	18.343	2.610	0.309	0.648	0.000	0.551	0.170	0.559	0.141	0.000	0.123
	81	9.500	2.680	0.374	0.791	0.011	0.632	0.236	0.600	0.206	1.000	0.119
	82	9.315	3.102	0.341	0.825	0.000	0.825	0.281	0.634	0.213	1.000	0.069
	83	15.372	3.776	0.611	0.692	0.007	0.469	0.287	0.644	0.212	1.000	0.049
MALAYSIA	77	4.739	0.430	0.091	1.339	0.012	0.300	0.027	0.364	0.142	0.000	0.518
	78	4.988	0.412	0.127	1.255	0.009	0.212	0.027	0.358	0.149	0.000	0.433
	79	3.536	0.312	0.060	1.412	0.009	0.384	0.023	0.344	0.208	0.000	0.388
	80	6.724	0.341	0.042	1.201	0.011	0.599	0.025	0.306	0.285	0.000	0.327
	81	9.700	0.565	0.067	1.019	0.010	0.548	0.037	0.245	0.227	0.000	0.312

Confidential

Confidential

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
MALAYSIA	82	5.834	0.849	0.111	0.971	0.009	0.522	0.058	0.174	0.137	0.000	0.282
	83	3.704	0.962	0.148	1.070	0.012	0.409	0.061	0.146	0.120	0.000	0.280
MALI	77	4.167	3.478	0.074	0.784	0.000	0.337	0.025	0.954	0.761	0.000	0.030
	78	8.428	4.627	0.091	0.392	0.000	0.324	0.029	0.949	0.814	0.000	0.024
	79	11.331	3.595	0.086	0.411	0.000	0.344	0.030	0.923	0.633	0.000	0.014
	80	18.343	3.375	0.068	0.468	0.012	0.417	0.028	0.937	0.446	0.000	0.028
	81	9.600	4.938	0.103	0.424	0.022	0.535	0.055	0.941	0.472	0.000	0.044
	82	9.763	6.641	0.300	0.439	0.027	0.318	0.095	0.835	0.172	0.000	0.048
	83	9.726	6.529	0.421	0.489	0.026	0.214	0.090	0.830	0.421	0.000	0.047
MARTINIQUE	77	10.300	2.935	0.262	0.758	0.000	0.219	0.057	0.679	0.431	0.000	0.200
	78	7.100	4.792	0.212	0.681	0.000	0.366	0.078	0.694	0.450	0.000	0.338
	79	9.000	4.215	0.450	0.567	0.000	0.234	0.106	0.773	0.182	0.000	0.335
	80	11.100	3.721	0.154	0.680	0.000	0.430	0.066	0.816	0.430	0.000	0.385
	81	19.090	3.194	0.209	0.975	0.000	0.339	0.071	0.880	0.383	0.000	0.524
	82	12.629	4.316	0.171	0.849	0.000	1.166	0.200	0.890	0.751	1.000	0.462
	83	0.887	4.945	0.574	0.939	0.000	0.392	0.225	0.898	0.917	1.000	0.439
MAURTITIUS	77	9.195	0.268	0.031	0.693	0.000	0.289	0.009	0.851	0.381	0.000	0.123
	78	8.491	0.505	0.042	0.650	0.000	0.616	0.026	0.667	0.471	0.000	0.072
	79	14.526	0.650	0.064	0.665	0.000	0.635	0.041	0.548	0.419	0.000	0.041
	80	42.674	0.722	0.088	0.708	0.000	0.567	0.050	0.516	0.289	0.000	0.118
	81	14.500	1.038	0.164	0.590	0.000	0.654	0.107	0.589	0.248	0.000	0.055
	82	11.354	1.104	0.195	0.787	0.000	0.552	0.108	0.624	0.329	0.000	0.077
	83	5.647	1.226	0.259	0.832	0.000	0.399	0.103	0.000	0.313	0.000	0.041
MEXICO	77	28.959	5.917	1.029	0.768	0.000	0.330	0.339	0.133	0.079	0.000	0.241
	78	17.544	5.460	1.255	0.789	0.000	0.285	0.358	0.116	0.062	0.000	0.196
	79	18.060	4.194	1.296	0.743	0.000	0.294	0.381	0.101	0.062	0.000	0.136
	80	26.422	2.794	0.638	0.800	0.005	0.472	0.301	0.103	0.061	0.000	0.123
	81	27.900	2.760	0.561	0.805	0.007	0.585	0.328	0.100	0.065	1.000	0.149
	82	58.952	2.798	0.528	1.412	0.000	0.697	0.368	0.118	0.073	1.000	0.054
	83	101.869	3.002	0.761	2.573	0.011	0.429	0.326	0.148	0.156	1.000	0.465
MOROCCO	77	12.600	3.270	0.230	0.407	0.000	0.532	0.122	0.464	0.413	0.000	0.137
	78	9.800	3.707	0.419	0.508	0.000	0.465	0.195	0.439	0.260	0.000	0.168
	79	12.000	3.421	0.460	0.532	0.000	0.525	0.241	0.423	0.268	0.000	0.122
	80	15.000	3.092	0.528	0.574	0.000	0.507	0.267	0.459	0.219	0.000	0.079
	81	12.500	3.514	0.577	0.542	0.000	0.505	0.291	0.519	0.188	1.000	0.050
	82	10.578	4.677	0.749	0.478	0.000	0.551	0.413	0.508	0.173	1.000	0.051
	83	5.611	5.815	1.171	0.492	0.000	0.459	0.537	0.529	0.294	1.000	0.036
NEPAL	77	9.804	0.895	0.035	0.479	0.000	0.500	0.017	1.000	0.786	0.000	0.710
	78	7.398	0.958	0.030	0.411	0.011	0.407	0.012	1.000	1.000	0.000	0.527
	79	3.563	1.132	0.030	0.428	0.009	0.455	0.014	1.000	1.000	0.000	0.495
	80	14.679	2.164	0.050	0.235	0.015	0.475	0.024	1.000	1.000	0.000	0.434
	81	11.100	1.653	0.035	0.381	0.016	0.531	0.019	1.000	1.000	0.000	0.486
	82	11.701	3.385	0.068	0.222	0.015	0.683	0.047	1.000	1.000	0.000	0.470
	83	12.832	3.682	0.094	0.202	0.014	0.583	0.055	1.000	0.988	0.000	0.286
NICARAGUA	77	11.449	1.493	0.184	0.836	0.000	0.483	0.089	0.474	0.257	0.000	0.161
	78	4.612	1.658	0.182	1.084	0.000	0.494	0.090	0.511	0.274	1.000	0.067
	79	48.096	2.082	0.122	1.573	0.000	0.867	0.106	0.587	0.481	1.000	0.083

Confidential

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
NICARAGUA	80	35.318	3.767	0.170	0.508	0.000	0.495	0.084	0.550	0.737	1.000	0.034
	81	23.900	4.421	0.376	0.509	0.000	0.487	0.183	0.561	0.538	1.000	0.030
	82	24.778	6.929	0.709	0.523	0.000	0.466	0.331	0.711	0.683	1.000	0.039
	83	31.048	7.334	0.741	0.564	0.000	0.420	0.312	0.715	0.670	1.000	0.000
NIGER	77	23.274	1.290	0.159	0.816	0.016	0.325	0.052	0.547	0.243	0.000	0.424
	78	10.026	1.099	0.106	0.925	0.016	0.470	0.050	0.553	0.225	0.000	0.324
	79	7.337	0.906	0.093	0.971	0.011	0.713	0.066	0.492	0.169	0.000	0.218
	80	10.254	1.076	0.146	0.953	0.010	0.691	0.101	0.454	0.300	0.000	0.167
	81	22.900	1.545	0.187	0.892	0.012	0.638	0.119	0.543	0.416	1.000	0.179
	82	11.635	2.080	0.397	0.752	0.014	0.629	0.250	0.564	0.329	1.000	0.061
	83	-2.478	2.484	0.358	0.969	0.033	0.795	0.285	0.657	0.344	1.000	0.189
NIGERIA	77	19.474	0.147	0.022	1.062	0.031	0.368	0.008	0.488	0.307	0.000	0.316
	78	18.649	0.260	0.017	0.822	0.029	0.425	0.007	0.332	0.492	0.000	0.115
	79	11.139	0.241	0.025	1.719	0.029	0.688	0.017	0.221	0.235	0.000	0.414
	80	11.359	0.211	0.031	1.595	0.022	0.793	0.024	0.176	0.141	0.000	0.484
	81	20.900	0.342	0.065	0.943	0.021	0.627	0.041	0.147	0.092	1.000	0.161
	82	7.527	0.602	0.110	1.121	0.000	0.622	0.069	0.115	0.073	1.000	0.101
	83	20.308	1.024	0.222	1.460	0.000	0.484	0.108	0.109	0.091	1.000	0.122
	84	34.999	1.051	0.254	2.921	0.000	0.328	0.083	0.109	0.091	1.000	0.196
PAKISTAN	77	9.000	5.802	0.282	0.486	0.000	0.439	0.124	0.940	0.779	0.000	0.174
	78	7.300	5.259	0.282	0.449	0.000	0.485	0.137	0.935	0.716	0.000	0.114
	79	9.300	4.060	0.282	0.507	0.000	0.435	0.123	0.915	0.696	1.000	0.055
	80	12.600	3.515	0.260	0.489	0.000	0.411	0.107	0.892	0.674	1.000	0.084
	81	11.880	3.189	0.214	0.512	0.000	0.373	0.080	0.903	0.599	1.000	0.121
	82	5.899	4.127	0.297	0.439	0.011	0.449	0.133	0.884	0.548	0.000	0.173
	83	7.444	3.204	0.280	0.577	0.017	0.390	0.109	0.900	0.705	0.000	0.366
PANAMA	77	4.552	5.591	0.694	0.291	0.000	0.444	0.308	0.272	0.144	0.000	0.068
	78	4.225	7.669	2.265	0.272	0.004	0.223	0.505	0.231	0.055	0.000	0.123
	79	7.985	7.120	1.327	0.256	0.002	0.511	0.679	0.231	0.105	0.000	0.078
	80	13.766	6.513	1.338	0.249	0.006	0.545	0.729	0.239	0.101	0.000	0.066
	81	7.300	7.826	1.631	0.213	0.000	0.578	0.943	0.240	0.165	1.000	0.067
	82	4.287	8.362	1.840	0.237	0.000	0.541	0.995	0.233	0.100	1.000	0.059
	83	2.055	8.099	1.431	0.340	0.007	0.559	0.799	0.383	0.212	1.000	0.158
PAPUA NEW GUINEA	77	4.319	0.500	0.040	1.064	0.000	0.697	0.028	0.355	0.369	0.000	0.548
	78	5.897	0.530	0.043	0.927	0.000	0.739	0.032	0.385	0.363	0.000	0.405
	79	5.687	0.458	0.056	0.978	0.003	0.545	0.030	0.394	0.249	0.000	0.425
	80	12.108	0.452	0.054	0.959	0.003	0.485	0.026	0.418	0.222	0.000	0.284
	81	8.100	0.749	0.081	0.661	0.000	0.671	0.054	0.382	0.220	0.000	0.309
	82	5.458	0.981	0.124	0.635	0.000	0.737	0.091	0.359	0.172	0.000	0.262
	83	7.895	1.022	0.138	0.667	0.004	0.582	0.080	0.366	0.205	0.000	0.370
PARAGUAY	77	9.298	1.419	0.135	0.905	0.021	0.375	0.051	0.684	0.356	0.000	0.716
	78	10.590	2.068	0.199	0.671	0.017	0.454	0.090	0.637	0.329	0.000	0.900
	79	28.257	2.168	0.263	0.586	0.016	0.474	0.125	0.558	0.291	0.000	0.890
	80	22.399	2.527	0.359	0.505	0.024	0.609	0.219	0.518	0.300	0.000	0.974
	81	14.000	3.174	0.412	0.493	0.042	0.596	0.246	0.485	0.258	0.000	1.156
	82	6.754	3.366	0.370	0.491	0.042	0.834	0.308	0.501	0.289	1.000	0.923
	83	13.394	2.855	0.446	0.877	0.061	0.519	0.231	0.568	0.363	1.000	1.234

Confidential

Sanitized Copy Approved for Release 2009/11/13 : CIA-RDP86T00586R000300310007-7

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
PERU	77	38.057	3.628	0.544	0.903	0.000	0.364	0.198	0.328	0.183	1.000	0.172
	78	57.855	3.723	0.556	0.991	0.000	0.448	0.249	0.352	0.226	1.000	0.171
	79	66.693	2.275	0.377	1.918	0.000	0.517	0.195	0.344	0.233	1.000	0.657
	80	59.210	2.084	0.489	1.560	0.000	0.430	0.211	0.389	0.231	1.000	0.640
	81	75.390	2.511	0.732	0.944	0.000	0.379	0.277	0.383	0.225	1.000	0.315
	82	64.445	2.812	0.655	0.914	0.000	0.451	0.296	0.364	0.274	1.000	0.353
	83	111.150	3.625	0.797	1.201	0.000	0.365	0.291	0.335	0.270	1.000	0.691
PHILIPPINES	77	7.967	1.606	0.274	0.732	0.000	0.300	0.082	0.285	0.186	0.000	0.294
	78	7.530	1.846	0.346	0.661	0.000	0.303	0.105	0.303	0.167	0.000	0.273
	79	18.908	1.593	0.311	0.695	0.000	0.394	0.123	0.314	0.213	0.000	0.269
	80	17.786	1.523	0.226	0.692	0.000	0.532	0.120	0.312	0.192	0.000	0.277
	81	13.300	1.805	0.339	0.668	0.000	0.514	0.174	0.329	0.159	0.000	0.230
	82	10.944	2.415	0.530	0.601	0.000	0.488	0.258	0.333	0.171	1.000	0.196
	83	10.899	2.761	0.561	0.614	0.000	0.463	0.260	0.000	0.190	1.000	0.096
RWANDA	77	14.505	0.802	0.014	0.749	0.017	0.769	0.011	0.977	0.615	0.000	0.556
	78	12.598	1.376	0.025	0.401	0.016	0.944	0.024	0.987	0.611	0.000	0.376
	79	15.691	1.115	0.016	0.592	0.028	0.889	0.014	0.970	0.389	0.000	0.601
	80	7.216	2.125	0.040	0.311	0.034	0.733	0.029	0.966	0.500	0.000	0.602
	81	6.600	2.189	0.057	0.290	0.025	0.596	0.034	0.950	0.511	0.000	0.527
	82	12.195	2.158	0.074	0.316	0.024	0.612	0.045	0.969	0.776	0.000	0.405
	83	6.773	2.488	0.089	0.290	0.035	0.603	0.053	0.976	0.836	0.000	0.373
SENEGAL	77	11.401	0.800	0.113	0.816	0.000	0.311	0.035	0.485	0.218	0.000	0.037
	78	3.329	1.680	0.278	0.559	0.003	0.270	0.075	0.487	0.167	0.000	0.020
	79	9.785	1.704	0.273	0.575	0.000	0.308	0.084	0.504	0.191	1.000	0.017
	80	8.696	2.125	0.437	0.453	0.000	0.276	0.120	0.566	0.188	1.000	0.007
	81	5.900	2.540	0.298	0.514	0.000	0.347	0.103	0.642	0.215	1.000	0.009
	82	17.280	3.488	0.354	0.459	0.001	0.477	0.169	0.693	0.386	1.000	0.011
	83	11.675	3.188	0.498	0.577	0.001	0.358	0.179	0.727	0.441	1.000	0.015
SIERRA LEONE	77	11.651	1.728	0.164	0.680	0.000	0.243	0.040	0.514	0.188	1.000	0.152
	78	7.536	1.795	0.296	0.599	0.000	0.185	0.055	0.482	0.272	1.000	0.096
	79	21.294	1.860	0.311	0.612	0.000	0.176	0.055	0.470	0.118	1.000	0.112
	80	11.111	1.874	0.239	0.486	0.000	0.175	0.042	0.613	0.073	1.000	0.056
	81	23.300	2.902	0.450	0.431	0.003	0.165	0.074	0.594	0.068	0.000	0.045
	82	31.062	3.404	0.531	0.372	0.000	0.272	0.144	0.608	0.209	1.000	0.027
	83	63.335	3.644	0.412	0.311	0.000	0.292	0.120	0.652	0.318	1.000	0.038
SINGAPORE	77	3.297	0.139	0.013	0.787	0.001	0.494	0.007	0.357	0.362	0.000	0.303
	78	4.728	0.137	0.034	0.777	0.001	0.287	0.010	0.344	0.146	0.000	0.312
	79	4.063	0.121	0.021	0.807	0.001	0.449	0.009	0.307	0.326	0.000	0.250
	80	8.460	0.088	0.018	0.807	0.002	0.478	0.008	0.331	0.341	0.000	0.215
	81	8.200	0.087	0.016	0.760	0.002	0.583	0.009	0.282	0.222	0.000	0.235
	82	3.882	0.098	0.019	0.738	0.002	0.510	0.009	0.232	0.198	0.000	0.273
	83	1.157	0.098	0.022	0.775	0.002	0.363	0.008	0.233	0.150	0.000	0.314
SOMALIA	77	10.559	6.499	0.124	0.277	0.000	0.321	0.040	0.938	0.372	0.000	0.435
	78	9.963	5.156	0.085	0.442	0.000	0.385	0.033	0.951	0.429	0.000	0.404
	79	24.279	6.126	0.184	0.387	0.000	0.441	0.081	0.878	0.206	0.000	0.118
	80	58.831	5.312	0.115	0.512	0.000	0.117	0.013	0.953	0.549	0.000	0.044
	81	44.400	4.535	0.124	1.004	0.000	0.360	0.045	0.929	0.652	0.000	0.136
	82	23.615	5.229	0.150	0.708	0.000	0.633	0.095	0.904	0.641	1.000	0.026

Confidential

Sanitized Copy Approved for Release 2009/11/13 : CIA-RDP86T00586R000300310007-7

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
SOMALIA	83	27.469	9.439	0.896	1.045	0.000	0.270	0.242	0.918	0.848	1.000	0.094
SOUTH KOREA	77	10.173	0.945	0.136	0.929	0.000	0.351	0.048	0.437	0.218	0.000	0.226
	78	14.460	1.001	0.164	0.849	0.001	0.329	0.054	0.397	0.195	0.000	0.142
	79	18.265	1.029	0.194	0.740	0.001	0.318	0.062	0.368	0.169	0.000	0.111
	80	28.700	1.004	0.176	0.785	0.000	0.446	0.078	0.371	0.205	0.000	0.103
	81	21.300	0.988	0.188	0.813	0.000	0.439	0.083	0.352	0.186	0.000	0.089
	82	7.255	1.072	0.208	0.901	0.000	0.506	0.105	0.356	0.186	0.000	0.105
	83	3.382	1.094	0.200	0.933	0.002	0.411	0.082	0.355	0.235	0.000	0.086
	84	1.999	0.914	0.179	1.053	0.002	0.415	0.074	0.355	0.235	0.000	0.087
SRI LANKA	77	1.253	1.059	0.168	1.083	0.000	0.178	0.030	0.886	0.492	0.000	0.345
	78	12.108	1.229	0.110	0.874	0.000	0.289	0.032	0.930	0.580	0.000	0.318
	79	10.745	1.218	0.099	0.676	0.000	0.416	0.041	0.878	0.593	0.000	0.272
	80	26.167	1.333	0.094	0.516	0.000	0.448	0.042	0.850	0.649	0.000	0.095
	81	17.900	1.540	0.100	0.571	0.001	0.588	0.059	0.770	0.527	0.000	0.149
	82	10.857	1.891	0.158	0.512	0.003	0.638	0.101	0.728	0.356	0.000	0.159
	83	14.002	2.027	0.180	0.584	0.009	0.561	0.101	0.719	0.409	0.000	0.157
SUDAN	77	16.755	3.599	0.209	0.611	0.000	0.285	0.060	0.588	0.430	1.000	0.018
	78	19.874	5.560	0.347	0.433	0.000	0.270	0.094	0.547	0.323	1.000	0.018
	79	30.813	6.545	0.193	0.482	0.000	0.419	0.081	0.733	0.564	1.000	0.046
	80	25.360	7.483	0.228	0.344	0.000	0.377	0.086	0.761	0.620	1.000	0.024
	81	24.600	8.107	0.301	0.437	0.000	0.147	0.044	0.639	0.389	1.000	0.010
	82	25.682	13.658	0.997	0.388	0.000	0.255	0.255	0.555	0.055	1.000	0.015
	83	29.349	11.263	1.741	0.461	0.000	0.281	0.489	0.569	0.393	1.000	0.012
SURINAM	77	9.703	0.018	0.003	0.779	0.000	0.333	0.001	1.000	0.889	0.000	0.208
	78	10.556	0.083	0.005	0.909	0.012	0.667	0.003	0.170	0.500	0.000	0.255
	79	13.936	0.066	0.007	1.081	0.012	0.656	0.005	0.139	0.438	0.000	0.318
	80	13.250	0.055	0.006	1.020	0.016	0.645	0.004	0.106	0.419	0.000	0.298
	81	8.700	0.058	0.006	0.834	0.014	0.655	0.004	0.109	0.379	0.000	0.317
	82	7.268	0.063	0.006	0.838	0.016	0.792	0.004	0.111	0.250	0.000	0.315
	83	4.460	0.058	0.009	1.041	0.007	0.487	0.004	0.040	0.308	0.000	0.139
SWAZILAND	77	20.863	0.306	0.016	0.805	0.009	0.536	0.008	0.935	0.750	0.000	0.348
	78	7.589	0.617	0.035	0.631	0.009	0.522	0.018	0.615	0.507	0.000	0.280
	79	16.598	0.743	0.054	0.538	0.006	0.543	0.030	0.680	0.378	0.000	0.199
	80	18.624	0.568	0.056	0.596	0.007	0.617	0.035	0.695	0.378	0.000	0.207
	81	20.000	0.508	0.059	0.635	0.007	0.655	0.039	0.747	0.345	0.000	0.140
	82	10.833	0.668	0.079	0.590	0.000	0.656	0.052	0.812	0.465	0.000	0.133
	83	16.842	0.902	0.111	0.406	0.003	0.547	0.061	0.811	0.544	0.000	0.148
SYRIA	77	11.797	1.434	0.104	0.400	0.000	0.304	0.032	0.867	0.539	0.000	0.160
	78	5.041	1.941	0.257	0.431	0.000	0.352	0.090	0.875	0.717	0.000	0.130
	79	4.811	1.430	0.221	0.494	0.000	0.315	0.070	0.903	0.802	0.000	0.141
	80	18.920	1.175	0.184	0.511	0.002	0.346	0.064	0.914	0.837	0.000	0.071
	81	18.390	1.239	0.182	0.417	0.001	0.378	0.069	0.918	0.837	0.000	0.056
	82	14.309	1.369	0.203	0.505	0.000	0.388	0.079	0.912	0.817	0.000	0.052
	83	7.536	1.632	0.250	0.421	0.000	0.370	0.093	0.936	0.870	0.000	0.039
TANZANIA	77	11.602	2.224	0.116	0.725	0.000	0.351	0.041	0.877	0.415	0.000	0.311
	78	11.386	2.860	0.200	0.416	0.000	0.403	0.081	0.804	0.284	0.000	0.067
	79	13.778	2.927	0.277	0.494	0.000	0.461	0.128	0.721	0.228	0.000	0.047

Confidential

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
TANZANIA	80	30.208	3.455	0.340	0.404	0.000	0.501	0.170	0.731	0.255	0.000	0.013
	81	25.600	3.235	0.440	0.478	0.002	0.401	0.176	0.750	0.276	0.000	0.013
	82	28.981	4.588	0.526	0.395	0.000	0.425	0.224	0.777	0.372	0.000	0.004
	83	27.037	5.133	0.554	0.539	0.000	0.391	0.216	0.000	0.441	0.000	0.024
THAILAND	77	7.634	0.573	0.081	0.756	0.007	0.395	0.032	0.448	0.335	0.000	0.341
	78	7.801	0.675	0.088	0.763	0.000	0.496	0.043	0.454	0.337	0.000	0.304
	79	10.000	0.768	0.106	0.740	0.000	0.552	0.058	0.409	0.268	0.000	0.207
	80	19.617	0.896	0.121	0.706	0.000	0.643	0.078	0.396	0.242	0.000	0.142
	81	12.700	1.036	0.155	0.706	0.000	0.691	0.107	0.393	0.207	0.000	0.158
	82	5.235	1.227	0.195	0.812	0.000	0.660	0.129	0.410	0.218	0.000	0.173
	83	3.710	1.556	0.248	0.622	0.003	0.541	0.134	0.420	0.294	0.000	0.159
	84	1.499	1.589	0.289	0.617	0.003	0.465	0.135	0.420	0.294	0.000	0.147
TOGO	77	22.437	2.014	0.356	0.561	0.007	0.173	0.061	0.341	0.060	0.000	0.134
	78	0.485	2.596	0.199	0.538	0.004	0.234	0.047	0.348	0.140	0.000	0.121
	79	7.246	3.920	0.170	0.421	0.006	0.259	0.044	0.448	0.562	0.000	0.097
	80	12.613	2.727	0.180	0.608	0.000	0.502	0.090	0.543	0.581	0.000	0.111
	81	20.100	4.093	0.195	0.477	0.000	0.475	0.093	0.641	0.645	1.000	0.301
	82	10.741	4.095	0.169	0.444	0.000	0.896	0.151	0.667	0.567	1.000	0.338
	83	9.023	4.100	0.610	0.444	0.000	0.403	0.246	0.671	0.391	1.000	0.369
TRINIDAD & TOBAGO	77	11.794	0.125	0.008	1.205	0.015	0.489	0.004	0.309	0.522	0.000	0.675
	78	10.253	0.214	0.017	1.037	0.015	0.675	0.012	0.193	0.362	0.000	0.705
	79	14.690	0.203	0.025	1.240	0.018	0.778	0.020	0.215	0.219	0.000	0.773
	80	17.509	0.196	0.064	1.283	0.020	0.281	0.018	0.254	0.083	0.000	0.687
	81	14.300	0.268	0.047	1.204	0.025	0.607	0.028	0.252	0.158	0.000	0.921
	82	11.461	0.367	0.070	0.831	0.026	0.471	0.033	0.222	0.189	0.000	0.756
	83	16.719	0.559	0.132	0.950	0.048	0.300	0.040	0.195	0.138	0.000	0.804
URUGUAY	77	58.750	1.349	0.428	0.832	0.000	0.242	0.104	0.302	0.235	0.000	0.535
	78	44.488	1.288	0.641	0.886	0.022	0.151	0.097	0.290	0.128	0.000	0.514
	79	66.758	1.443	0.206	0.653	0.013	0.562	0.116	0.262	0.254	0.000	0.299
	80	63.399	1.253	0.224	0.652	0.016	0.549	0.123	0.242	0.178	0.000	0.259
	81	34.000	1.393	0.214	0.740	0.017	0.706	0.151	0.187	0.178	1.000	0.297
	82	19.030	2.035	0.283	0.927	0.000	0.755	0.214	0.175	0.165	1.000	0.185
	83	49.216	2.747	0.479	1.627	0.014	0.441	0.211	0.179	0.232	1.000	0.463
VENEZUELA	77	7.886	0.662	0.123	0.873	0.076	0.286	0.035	0.079	0.105	0.000	0.618
	78	7.018	1.027	0.132	0.781	0.050	0.514	0.068	0.053	0.086	0.000	0.428
	79	12.432	0.861	0.143	1.342	0.038	0.469	0.067	0.037	0.047	0.000	0.558
	80	21.507	0.741	0.191	1.625	0.041	0.464	0.089	0.030	0.026	0.000	0.472
	81	16.000	0.788	0.203	1.536	0.042	0.601	0.122	0.023	0.023	0.000	0.566
	82	9.741	1.189	0.302	1.312	0.054	0.530	0.160	0.015	0.017	1.000	0.506
	83	6.284	1.419	0.314	1.786	0.104	0.482	0.151	0.014	0.017	1.000	0.911
ZAIRE	77	69.048	2.940	0.123	1.622	0.000	0.584	0.072	0.377	0.325	1.000	0.196
	78	48.503	3.907	0.158	1.571	0.000	0.638	0.101	0.414	0.325	1.000	0.182
	79	108.595	3.203	0.225	2.215	0.000	0.504	0.114	0.382	0.260	1.000	0.277
	80	42.086	2.590	0.272	1.954	0.000	0.508	0.138	0.539	0.416	1.000	0.204
	81	34.910	6.510	0.516	0.991	0.034	0.531	0.274	0.596	0.358	1.000	0.214
	82	37.210	7.808	0.654	1.185	0.000	0.560	0.366	0.657	0.387	1.000	0.267
	83	53.176	10.022	1.795	0.969	0.000	0.379	0.681	0.000	0.499	1.000	0.470

COUNTRY	YEAR	CPID	DBEXP	DSEXP	EXPIMP	IMFIMP	INTDS	INTEXP	OFTLDB	OFTLDS	RSCL	RSIMP
ZAMBIA	77	19.624	1.668	0.237	1.140	0.000	0.315	0.075	0.529	0.206	0.000	0.077
	78	16.405	1.968	0.328	1.156	0.000	0.310	0.102	0.563	0.178	0.000	0.063
	79	9.681	1.544	0.227	1.518	0.000	0.290	0.066	0.599	0.217	0.000	0.075
	80	11.732	1.699	0.236	1.073	0.000	0.376	0.089	0.659	0.271	0.000	0.053
	81	14.000	2.359	0.316	0.842	0.006	0.316	0.100	0.661	0.345	1.000	0.044
	82	12.456	2.494	0.235	1.062	0.000	0.584	0.137	0.654	0.386	1.000	0.060
	83	19.832	2.963	0.456	1.000	0.000	0.381	0.174	0.685	0.469	1.000	0.066
ZIMBABWE	77	10.305	0.175	0.007	1.234	0.000	0.295	0.002	0.286	0.852	0.000	0.092
	78	9.737	0.465	0.009	1.312	0.000	0.506	0.005	0.099	0.588	0.000	0.174
	79	13.789	0.498	0.014	1.133	0.000	0.500	0.007	0.074	0.358	0.000	0.254
	80	5.374	0.505	0.031	0.977	0.000	0.222	0.007	0.144	0.161	0.000	0.124
	81	13.100	0.675	0.078	0.781	0.000	0.321	0.025	0.214	0.104	0.000	0.090
	82	10.698	0.868	0.170	0.778	0.000	0.419	0.071	0.196	0.091	0.000	0.086
	83	23.083	0.825	0.190	0.931	0.000	0.490	0.093	0.000	0.111	0.000	0.058

25X1

Confidential

Sanitized Copy Approved for Release 2009/11/13 : CIA-RDP86T00586R000300310007-7

Sanitized Copy Approved for Release 2009/11/13 : CIA-RDP86T00586R000300310007-7